

Cooling Systems Division

Kesatsugu Watanabe

The Cooling Systems Division endeavors to supply the optimum cooling systems to all customers. In 1997, the Cooling Systems Division enlarged its product lineup of cooling systems, improved its technologies and enhanced the CPU cooler "SAN ACE MC".

We have developed the following new products:

1. Long Life Fan
"SAN ACE 172L"
2. 80 mm sq.×25 mm thick Splash Proof Fan
"SAN ACE 80W"
3. $\phi 200 \times 70$ mm thick BLDC Fan
"SAN ACE 200"
4. "SAN ACE MC note"
5. "SAN ACE MC" for Pentium® II*

The above new products have been added to product ranges of Long Life Fans, Splash Proof Fans, BLDC Fan and "SAN ACE MC". Our cooling fan series has thus been extended, and will find wider application in many fields as cooling devices for various instruments.

* Pentium® is a registered trademark of Intel Corporation.

"SAN ACE 172L"

We have added a new product to our Long Life Fan series. This new Long Life Fan comes in two different sizes ($\phi 172$ - 150 mm width) $\times 51$ mm thick and $\phi 172 \times 51$ mm thick. The expected life is 100,000 hours at ambient temperature of 60°C for both models, which is 2.5 times that of conventional fans while the characteristics and the installation size remain the same.

This size of fan is commonly used in instruments that require high reliability, and this new product meets the market need for longer life. Our Long Life Fans come in five different sizes: the existing 80 mm sq., 92 mm sq., 120 mm sq. and 140 mm sq. in addition to newly developed "SAN ACE 172L".



"SAN ACE 80W"

Our Splash Proof Fan series offers four sizes: 80 mm sq., 92 mm sq., 120 mm sq. and 140 mm sq. with the development of new "SAN ACE 80W".

These Splash Proof Fans are ideal for cooling outdoor equipment and are popular with customers. Customers now demand compact, long life Splash Proof Fan for outdoor equipment such as communications equipment that continue to be downsized. The highly reliable, long life



Splash Proof Fan of 80 sq.×25 mm thick is designed to meet such needs. The level of water protection satisfies the JIS C 0920 water protection (IPX3) specifications, and its structure withstands the salt water spray test (1,000 hours) conforming to ASTM B 117.

"SAN ACE 200"

"SAN ACE 200" is the largest cooling fan of BLDC fan series. Whereas the largest fan used to be $\phi 172 \times 51$ mm thick, this BLDC fan is $\phi 200 \times 70$ mm thick to meet the market need for a low noise, large capacity cooling fan for cooling larger equipment.

"SAN ACE 200" has a high air volume and low noise level, and runs off 24 V. The large-size fan offers many advantages such as improved cooling efficiency and low noise operation for cooling equipment. It is ideal for cooling large equipment such as computers and semiconductor manufacturing equipment.



"SAN ACE MC note"

This cooling device is primarily for notebook personal computers; the cooling fan and heat sink are integrated into a single body. The fan offers high reliability as well as cooling performance thanks to the design technology used in existing "SAN ACE MC200". The innovative frame shape minimizes degradation of cooling characteristics when obstructions are placed in front of the air intake side of the fan.

This compact fan measures just 44.5 mm sq.×10 mm thick, and is best suited for slim notebook personal computers that have little free space inside. It operates on 5 V DC, and is equipped with an ON/OFF control terminal.



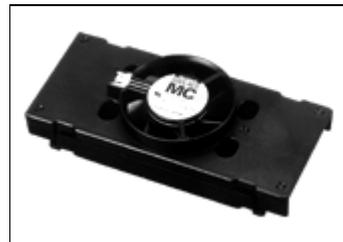
"SAN ACE MC" for Pentium® II

This cooling device is designed for the high-speed microprocessor Pentium® II.

It offers high reliability and cooling performance, and measures (120 - 53.4)×28.1 mm thick. It operates on 12 VDC, and is equipped with a pulse sensor output enabling its rotation to be monitored. This product will

find a wide range of applications in many fields, like "SAN ACE MC note".

"SAN ACE MC" high-speed microprocessor cooling fan series now comes in six models including the existing ones for Pentium®, Pentium® PRO, and newly developed "SAN ACE MC note" and "SAN ACE MC" for Pentium® II.



Kesatsugu Watanabe
Joined company in 1973
Cooling Systems Division, Design Dept.
Worked on development and design of fan motors
